APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

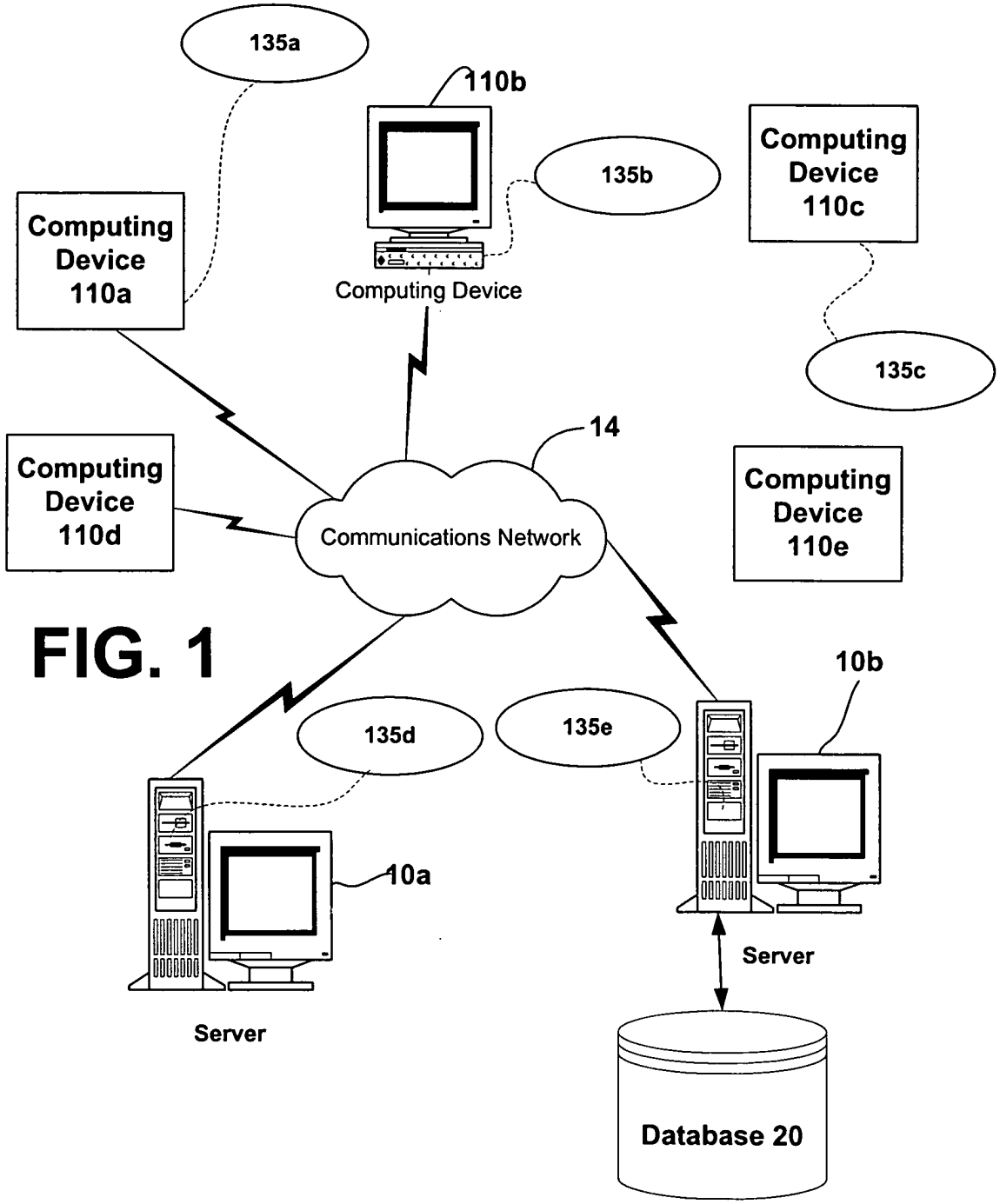

FIG. 1

Docket #MSFT-0579/167505.2 Application #

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Replaced Sheet

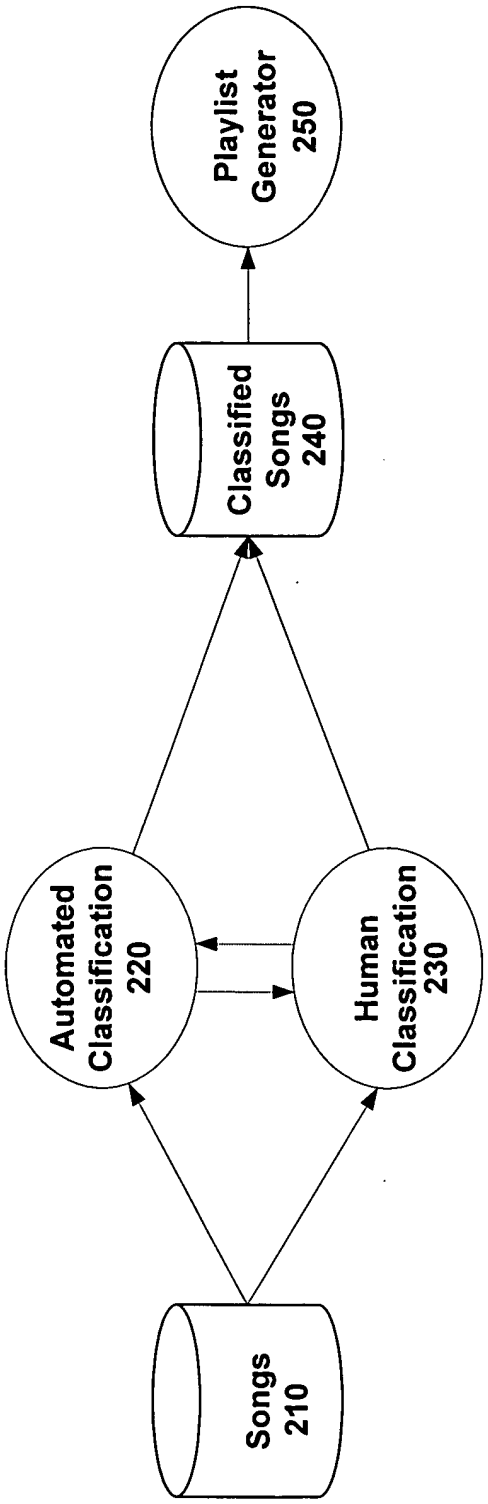

Fig. 2

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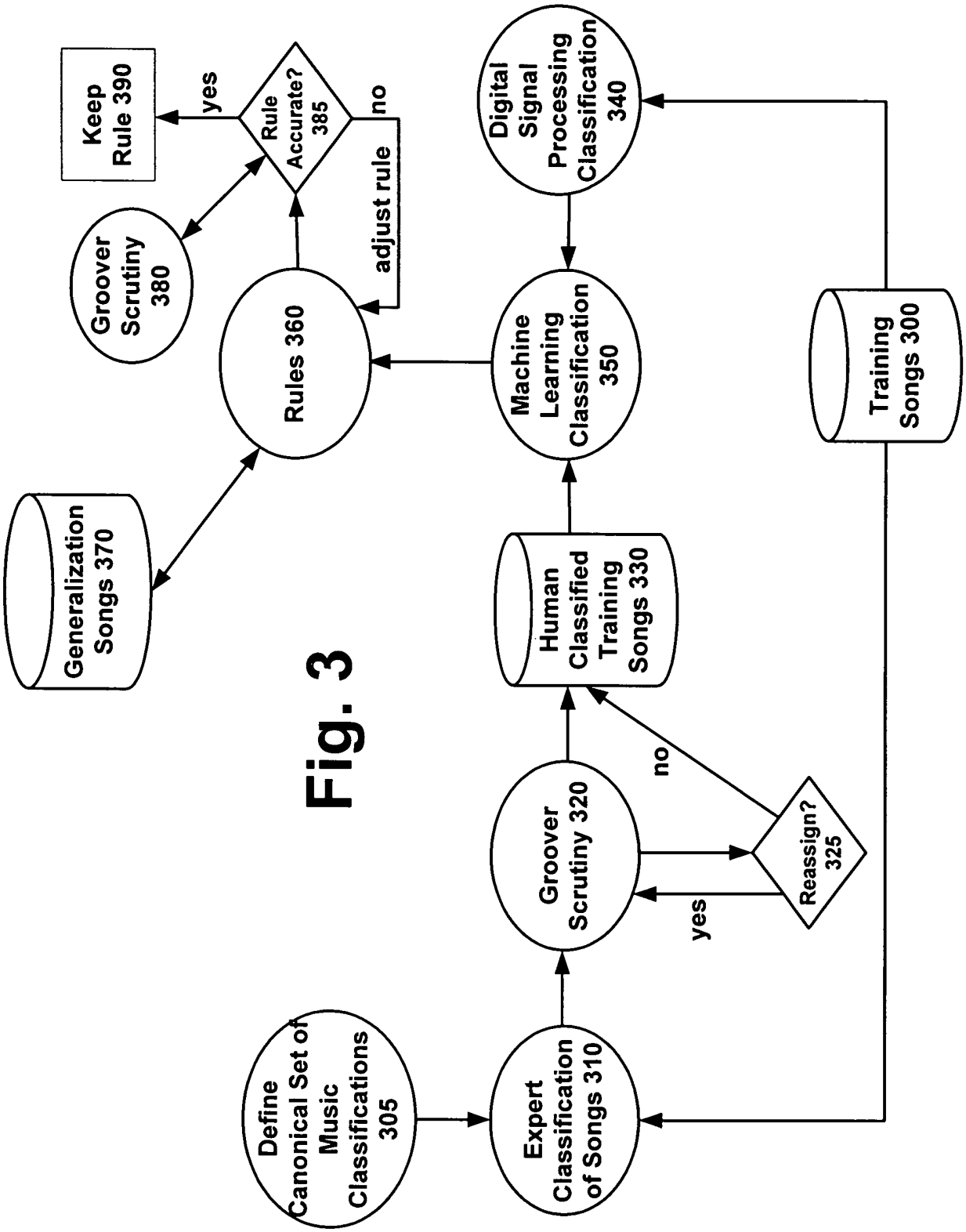

Fig. 3

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Fig. 4A

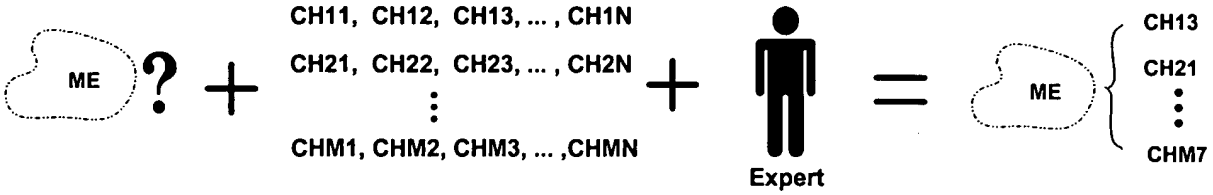

Fig. 4B

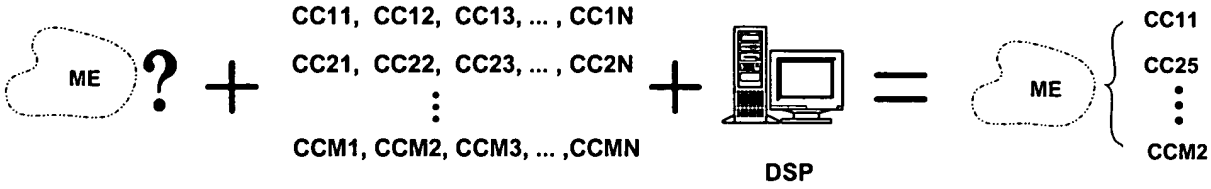

Fig. 4C

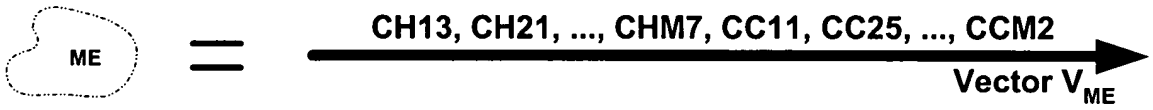

Fig. 4D

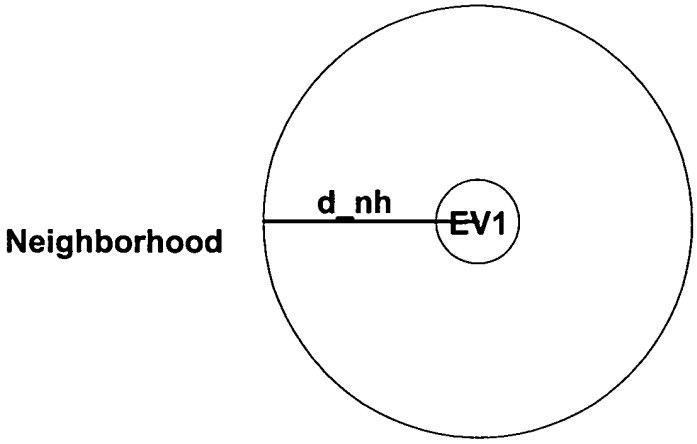

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Fig. 5A

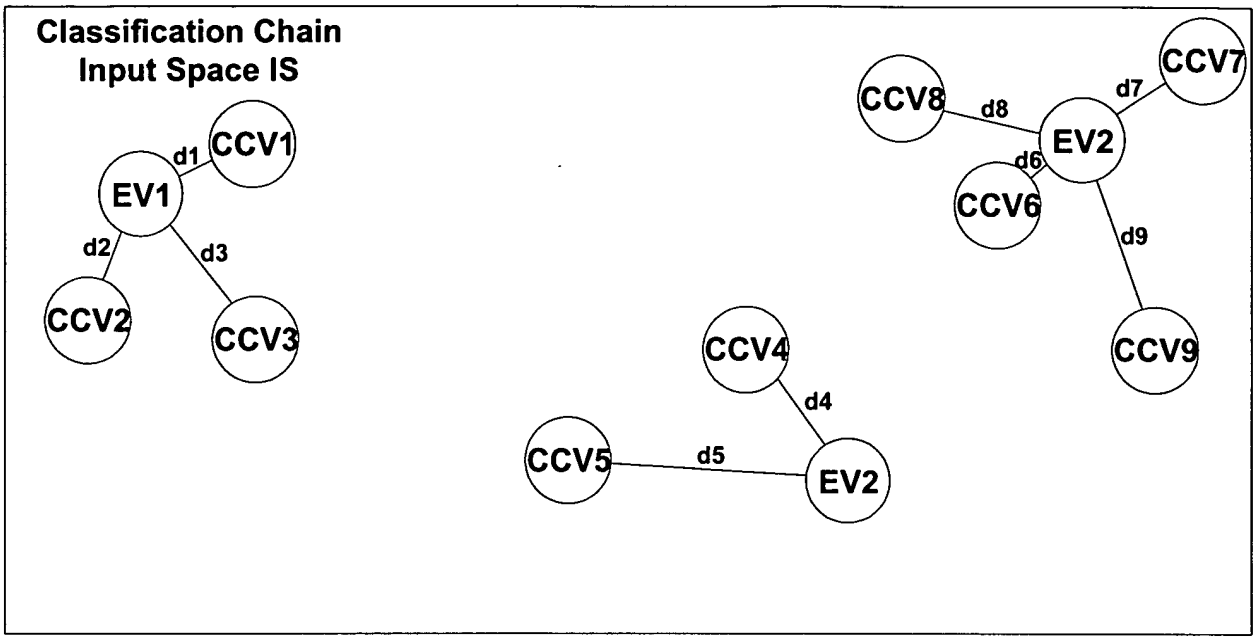

Fig. 5B

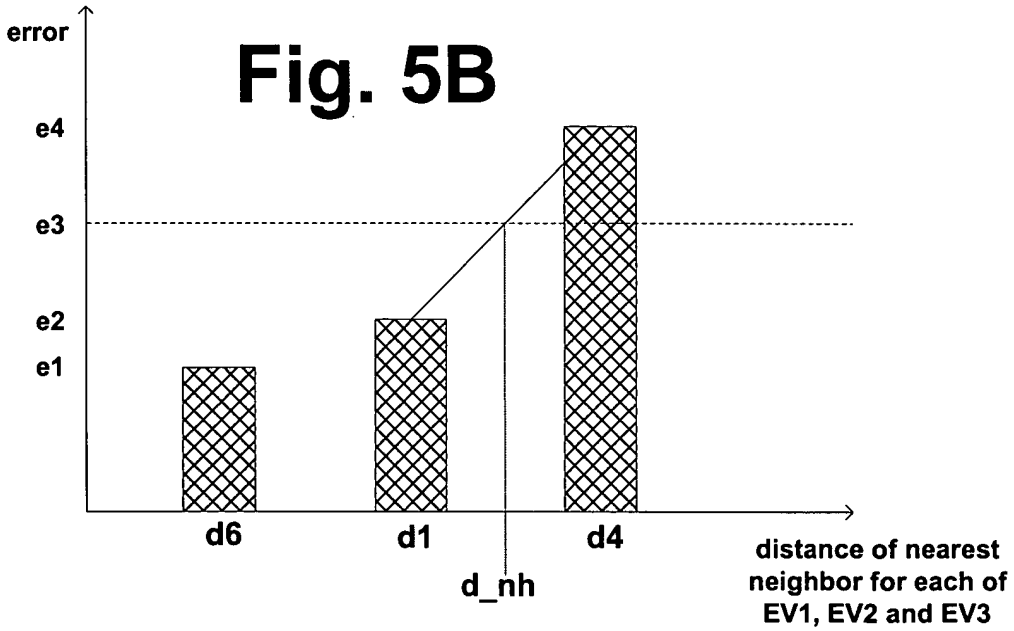

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Fig. 6A

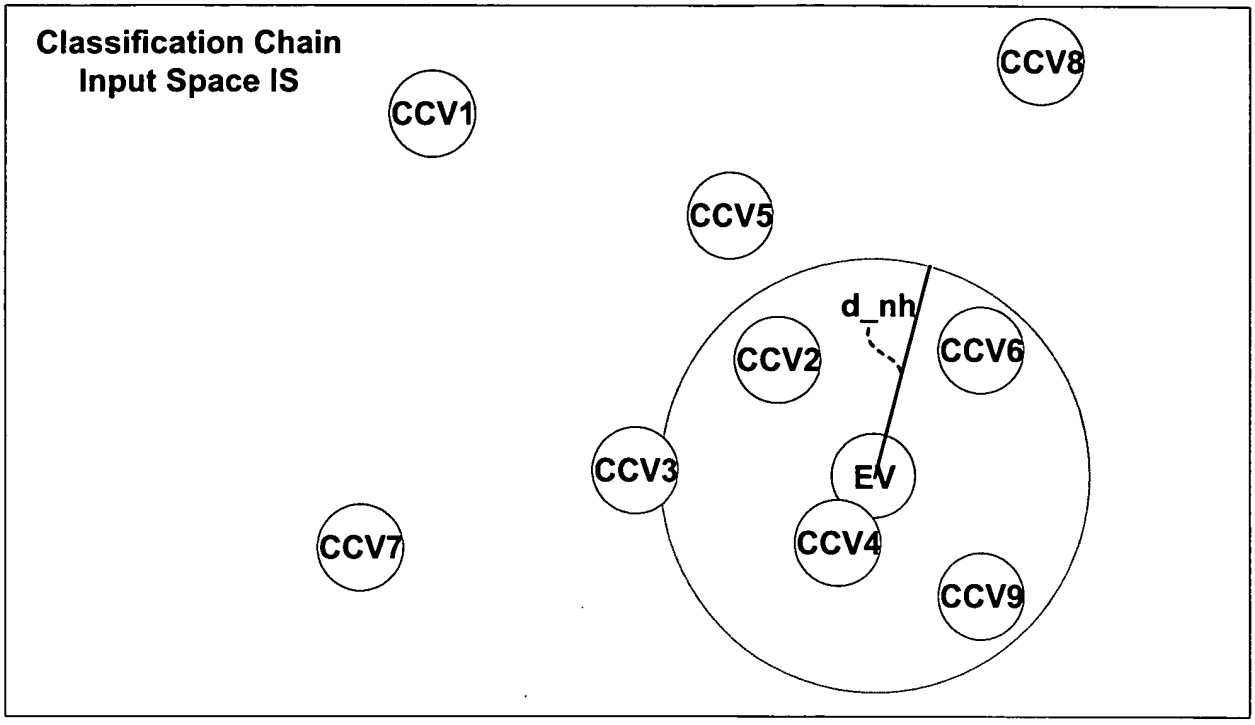
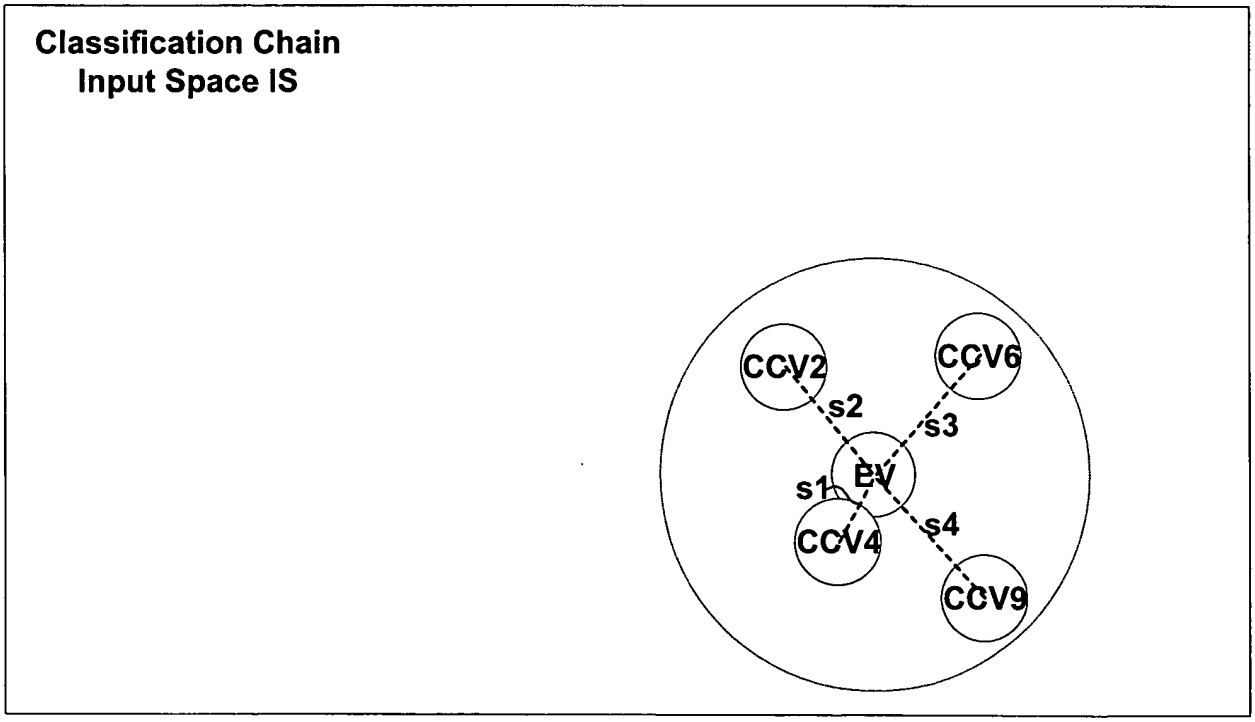


Fig. 6B



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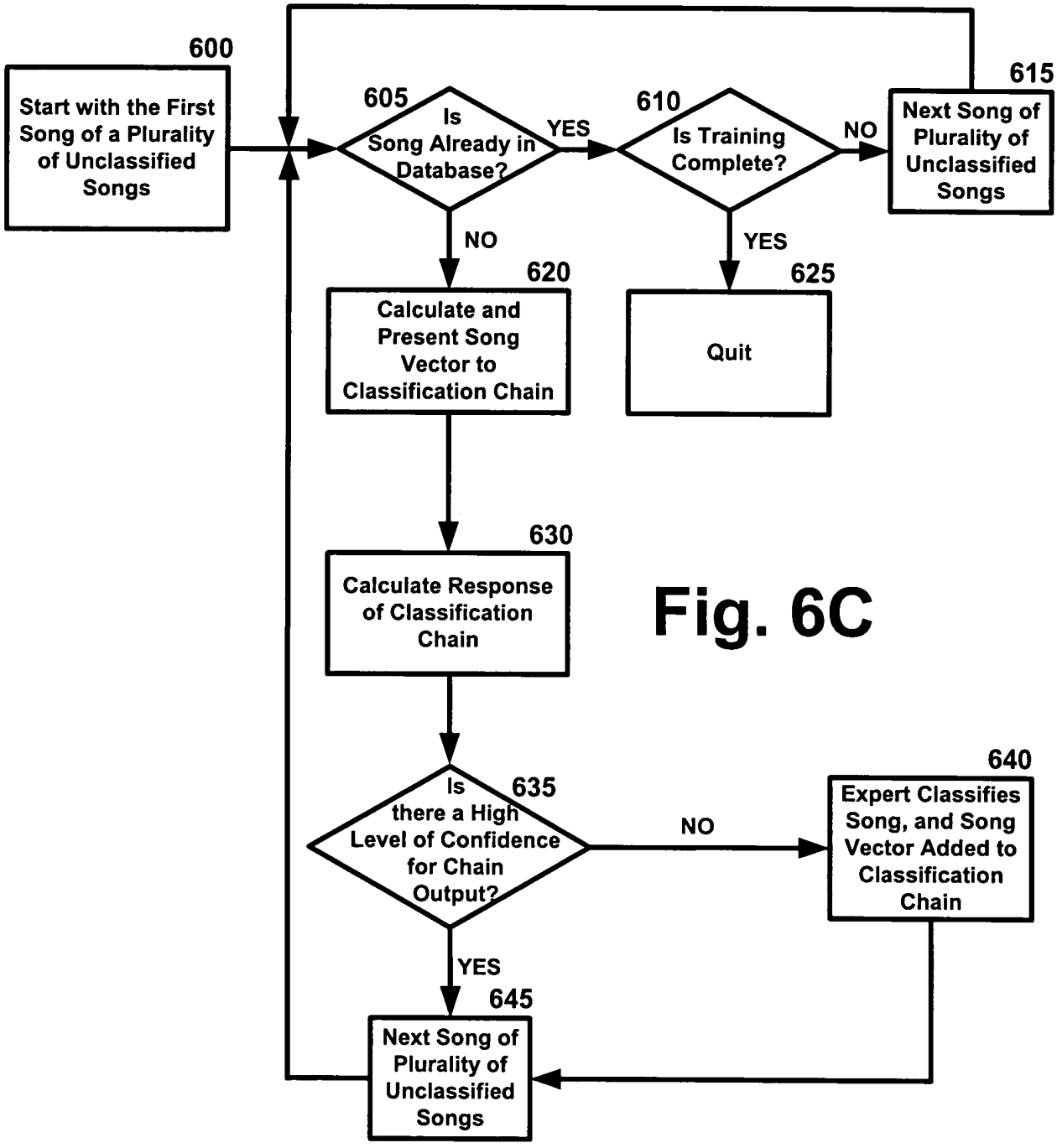

Fig. 6C

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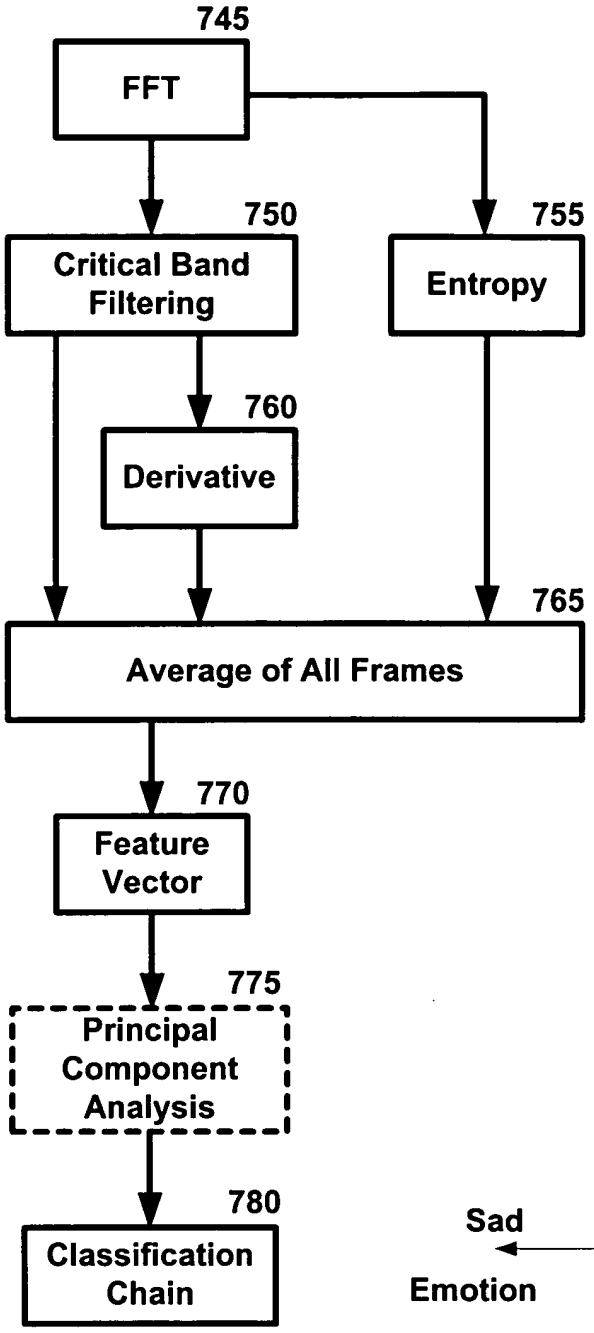

Fig. 7A

Fig. 7B

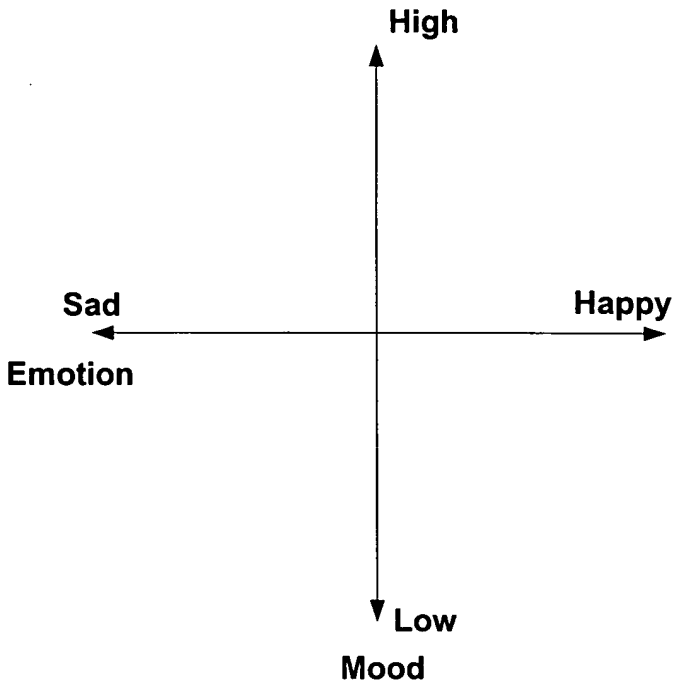

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Fig. 8A

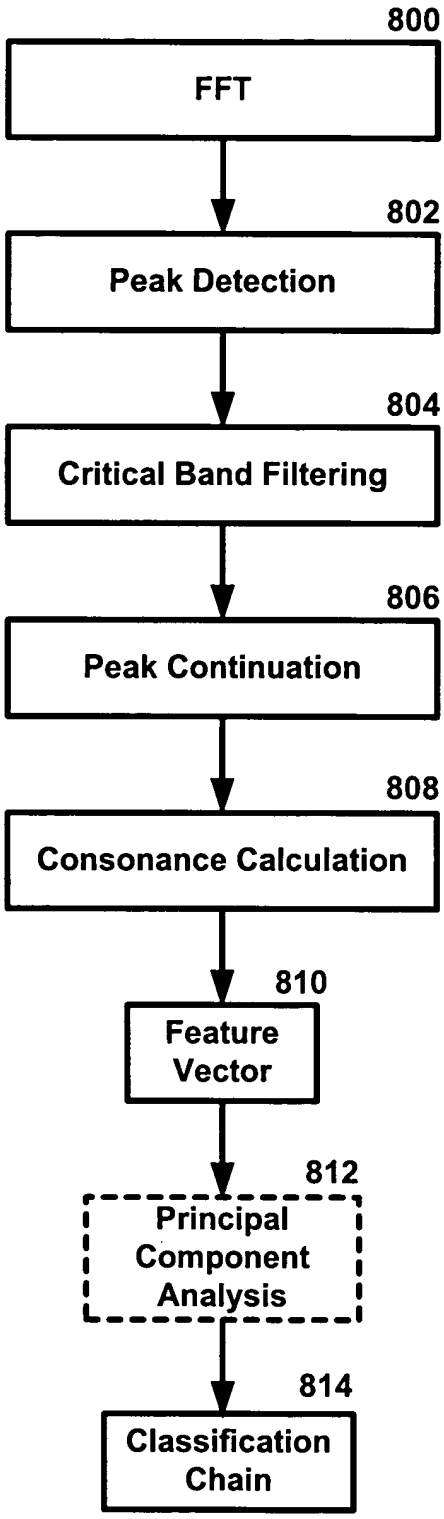

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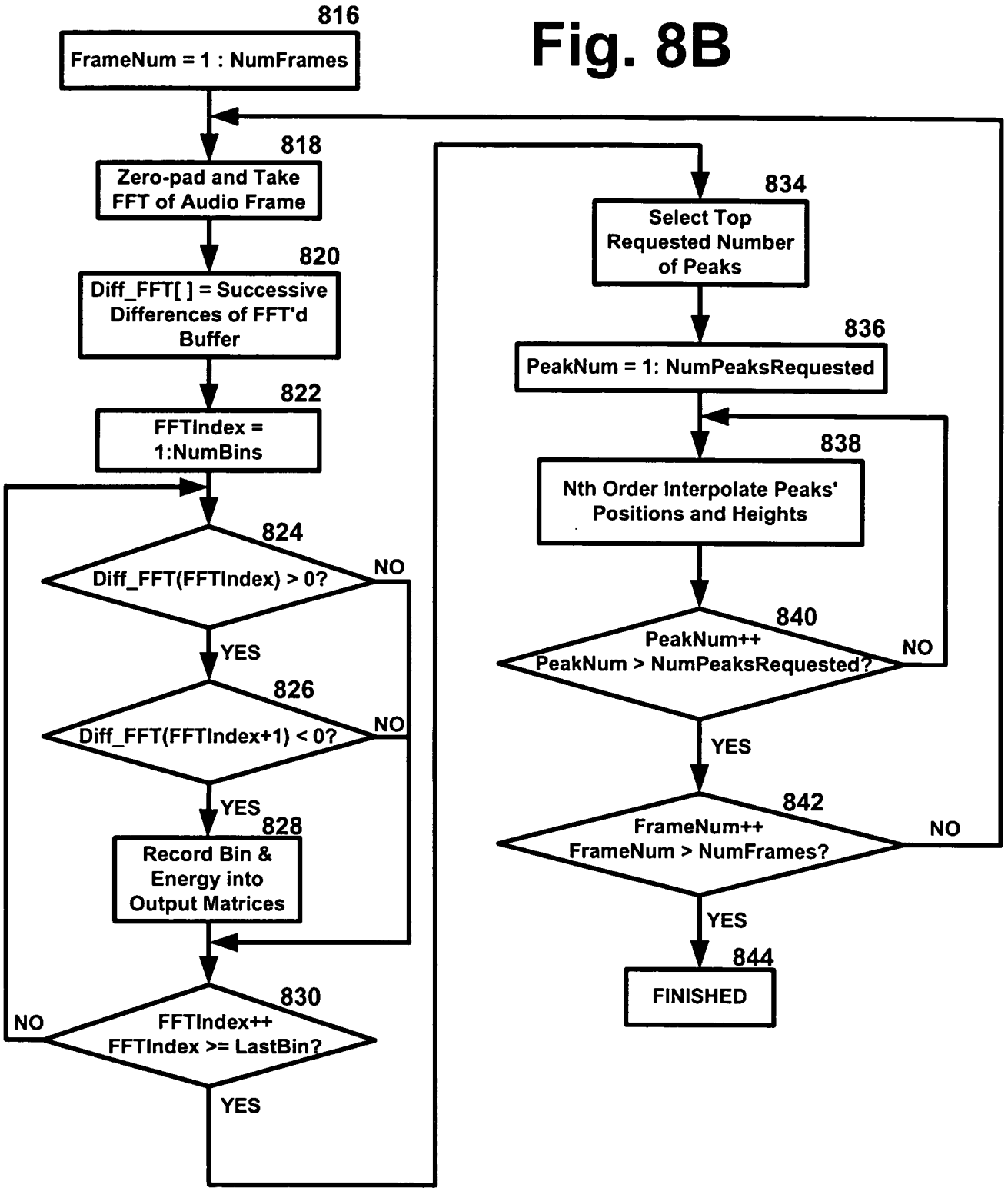
Fig. 8B



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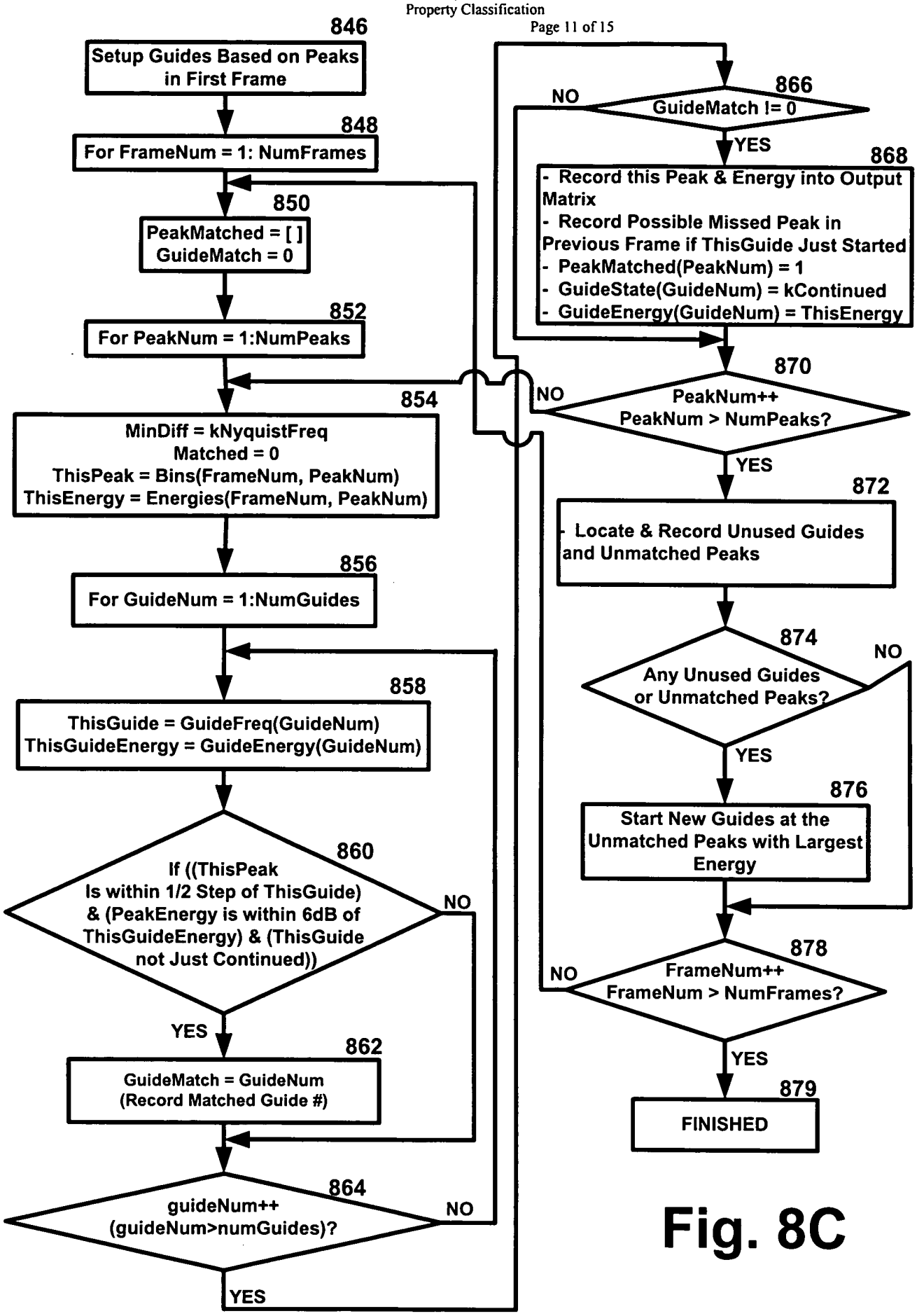

Fig. 8C

O.G. FIG.
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Fig. 8D

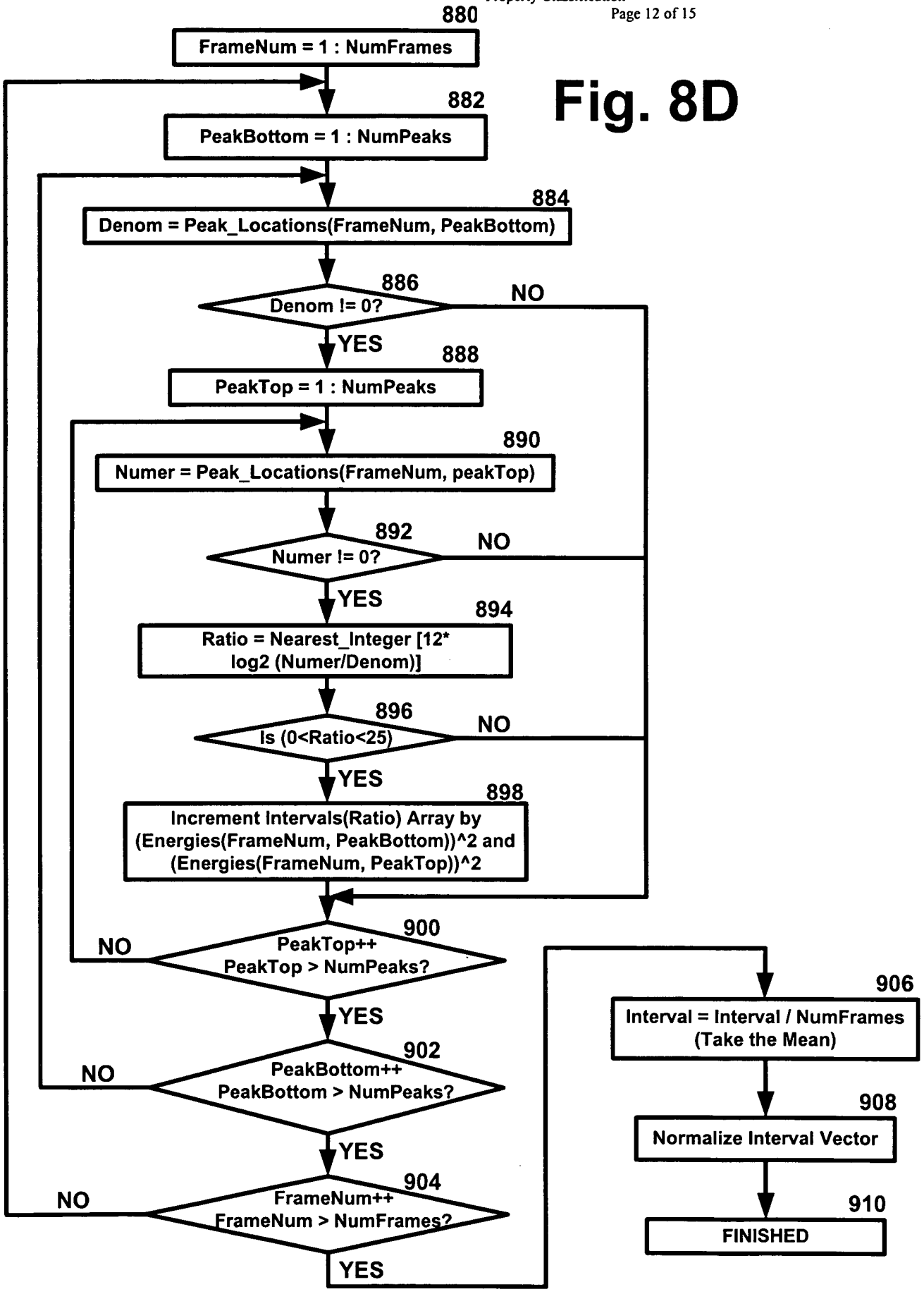

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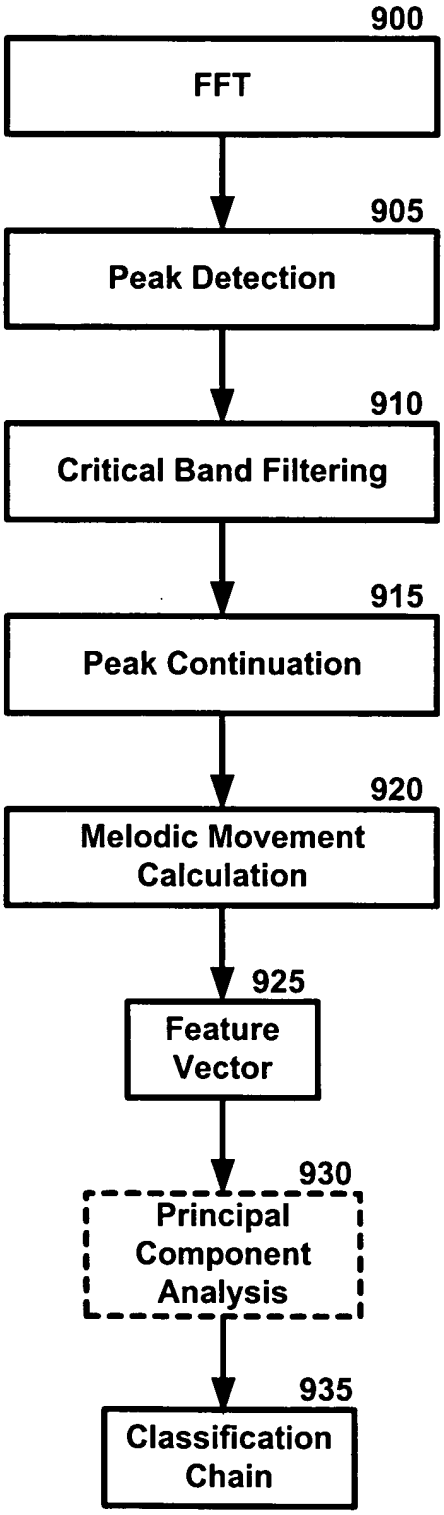
Fig. 9A



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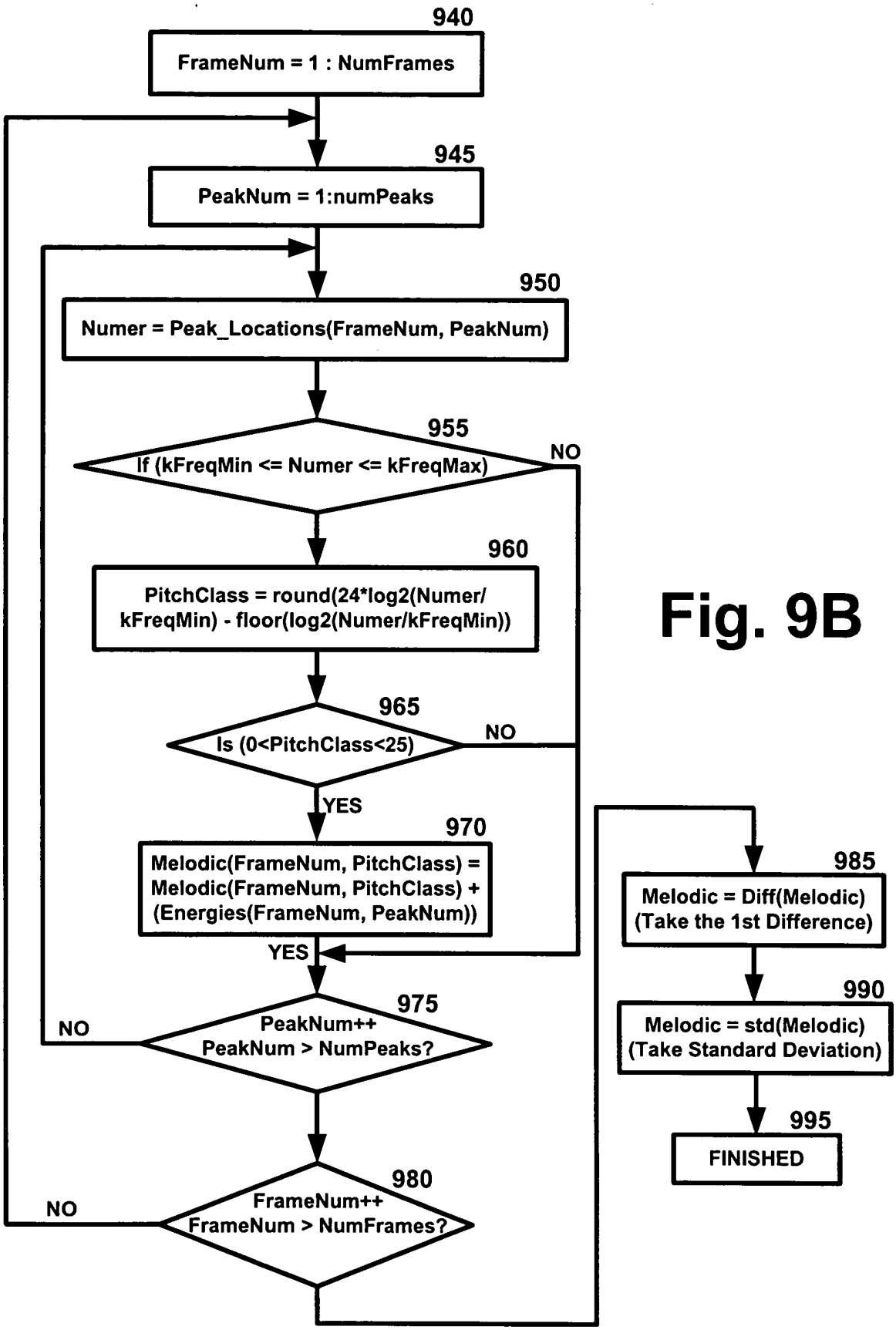

Fig. 9B

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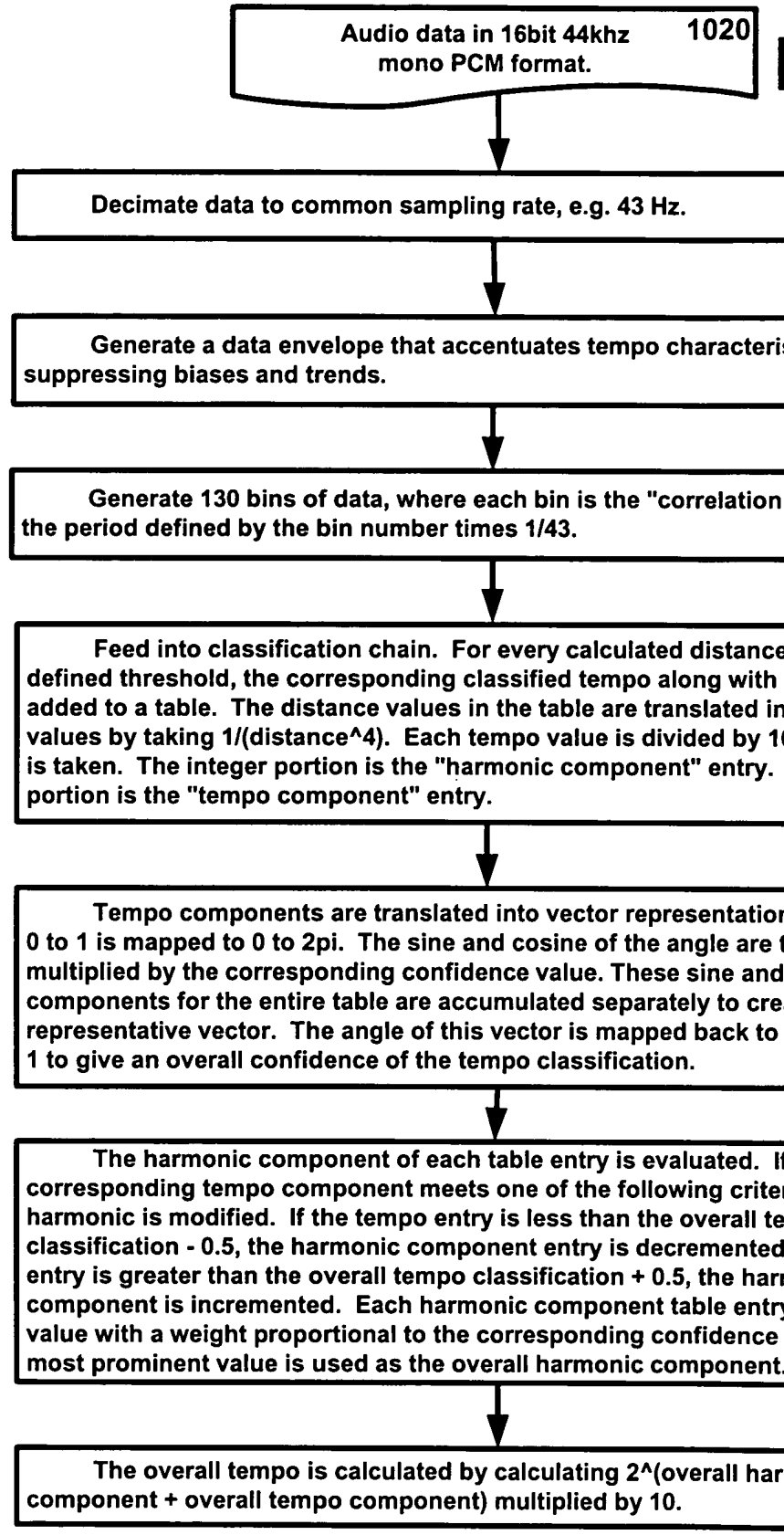
Audio data in 16bit 44khz mono PCM format.
1020
1030
Decimate data to common sampling rate, e.g. 43 Hz.
1040
Generate a data envelope that accentuates tempo characteristics while suppressing biases and trends.
1050
Generate 130 bins of data, where each bin is the "correlation strength" for the period defined by the bin number times 1/43.
1060
Feed into classification chain. For every calculated distance that is below a defined threshold, the corresponding classified tempo along with the distance is added to a table. The distance values in the table are translated into confidence values by taking 1/(distance^4). Each tempo value is divided by 10 and the log2 is taken. The integer portion is the "harmonic component" entry. The fractional portion is the "tempo component" entry.
1070
Tempo components are translated into vector representation. The range of 0 to 1 is mapped to 0 to 2pi. The sine and cosine of the angle are taken and multiplied by the corresponding confidence value. These sine and cosine components for the entire table are accumulated separately to create an overall representative vector. The angle of this vector is mapped back to a range of 0 to 1 to give an overall confidence of the tempo classification.
1080
The harmonic component of each table entry is evaluated. If the corresponding tempo component meets one of the following criteria, the harmonic is modified. If the tempo entry is less than the overall tempo classification - 0.5, the harmonic component entry is decremented. If the tempo entry is greater than the overall tempo classification + 0.5, the harmonic component is incremented. Each harmonic component table entry "votes" for its value with a weight proportional to the corresponding confidence value. The most prominent value is used as the overall harmonic component.
1090
The overall tempo is calculated by calculating 2^(overall harmonic component + overall tempo component) multiplied by 10.

Fig. 10